quantumdata

APPLICATION NOTE - TESTING HDMI® PROTOCOL COMPLIANCE

The HDMI, LLC requires source devices to be tested for protocol compliance in accordance with Test Sections 7.4, 7.5, 7.6, 7.7 and 7.8. The HDMI Compliance Testing Policies and Procedures provide for self-testing under certain conditions. Whether or not self-testing applies in any particular case, pre-testing is always recommended prior to submission to an Authorized Test Center (ATC). The Quantum Data 980 Protocol Analyzer and Compliance tester is an ideal solution for both pre-testing and self-testing. Quantum Data has a history or providing approved compliance test solutions for HDMI devices. These include: EDID, CEC, HDCP.

The Quantum Data 980 Protocol Analyzer and Compliance tester is an ideal solution for both pre-testing and self-testing of source devices.

TEST CONFIGURATION OPTIONS

The 980 is convenient to use and runs through the source compliance tests quickly. It allows you to configure a test series in several ways in order to meet your specific application. These configuration options are specified through simple dialog boxes.

For example you can select which tests to run for a particular test suite. This enables you to run quick initial tests on specific test sections or Test IDs (Figure 1). You can also specify to run tests only at specific resolutions and audio formats (Figure 2).

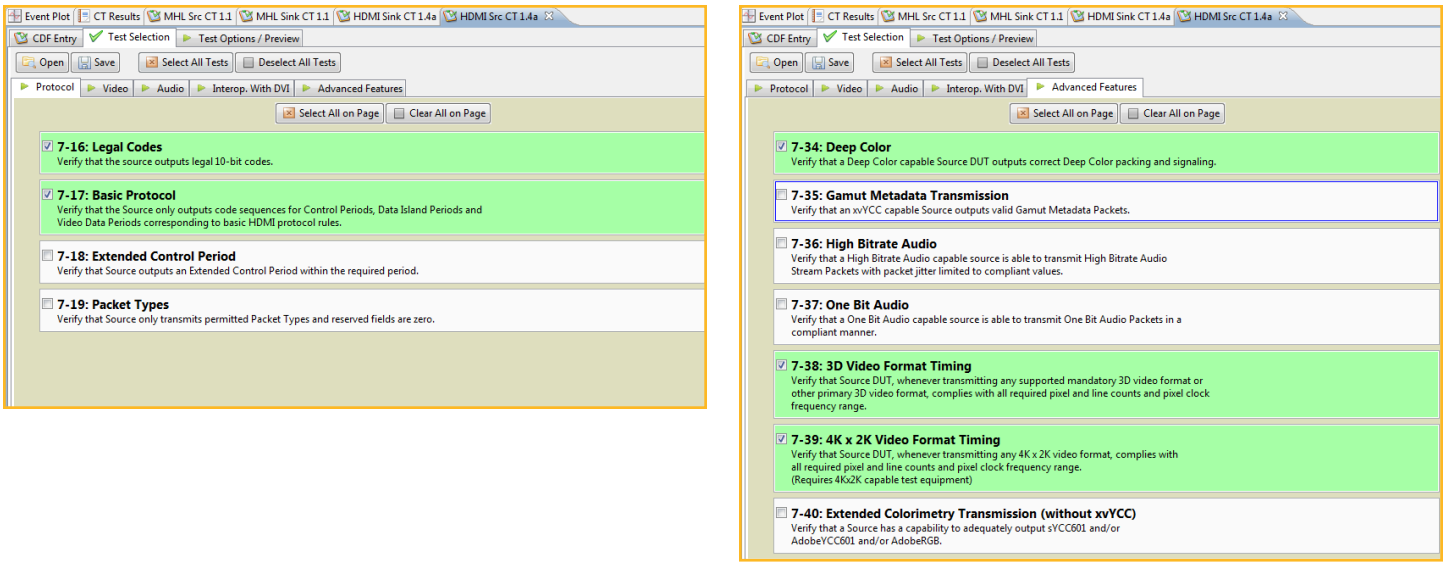

Figure 1

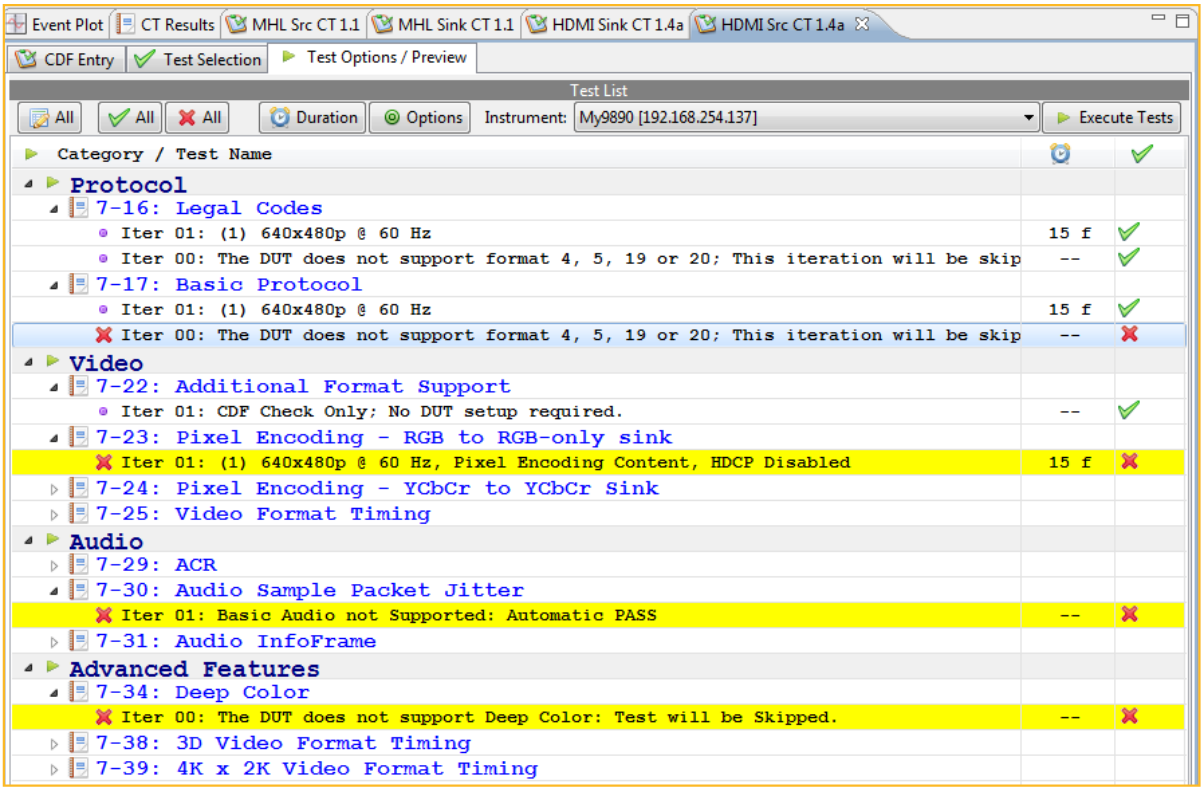

Figure 2

You can also configure the order of execution for a test series. This enables you to run through a variety of tests on a specific video resolution or audio format in order to minimize user interaction. You can also specify how much data is captured and stored during the test. You may want to capture data in all cases, or only in instances where there is a failure in one of the tests. Capturing and storing test data requires more time so specifying that no data is captured and stored, is appropriate for preliminary test scans. These options are specified through a simple dialog box (Figure 3).

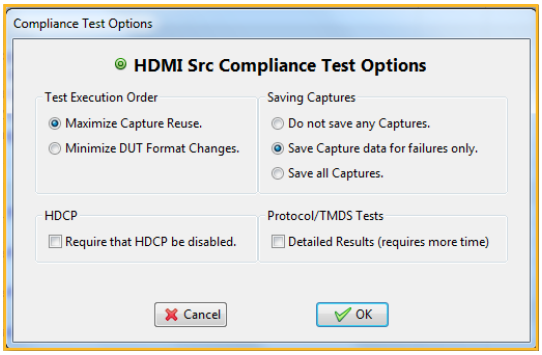

Figure 3

ACCESSING CAPTURED TEST DATA

If you have captured and stored the compliance test data, you can link directly using the Show in Capture button (Figure 4) to the data related to a failure; if a failure occurred. This enables you to quickly verify a failure and debug the root cause of the problem. Having the captured data also enables you to disseminate it to other subject matter experts for further analysis. Your colleagues can examine the data using the external 980 GUI Manager without having the 980 Protocol Analyzer.

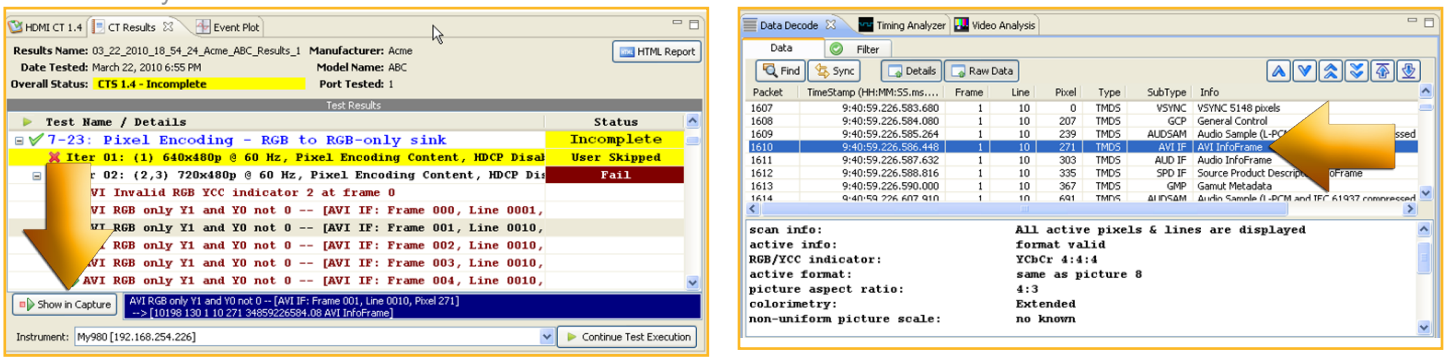

Figure 4

PROTOCOL TESTS – SECTION 7.4

The Protocol Tests in Section 7.4 require special consideration. Until recently the HDMI protocol analysis test tools that have been commercially available could not provide the visibility into all the data necessary to verify the results of the protocol tests in Section 7.4. Now however, the 980 has been enhanced with a new capture mode called the Protocol Analysis mode. The Protocol Analysis mode provides full visibility into the HDMI protocol data such as the guard band and preamble information. The guard band and preamble data is essential for verifying the results of the test in the Protocol Tests section of the HDMI source compliance test series. Visibility into the guard band and preamble is also essential for debugging failures during the Protocol Test series.

If failures occur during the Protocol compliance test, a separate capture in the Protocol Analysis mode can be initiated to check the protocol data. For example the Legal Codes and Basic Protocol Tests (Test IDs 7-16 & 7-17) verify that the preambles and guard bands are correct. If a failure occurs during one of these tests, you can run a capture and view the relevant protocol data (Figure 5).

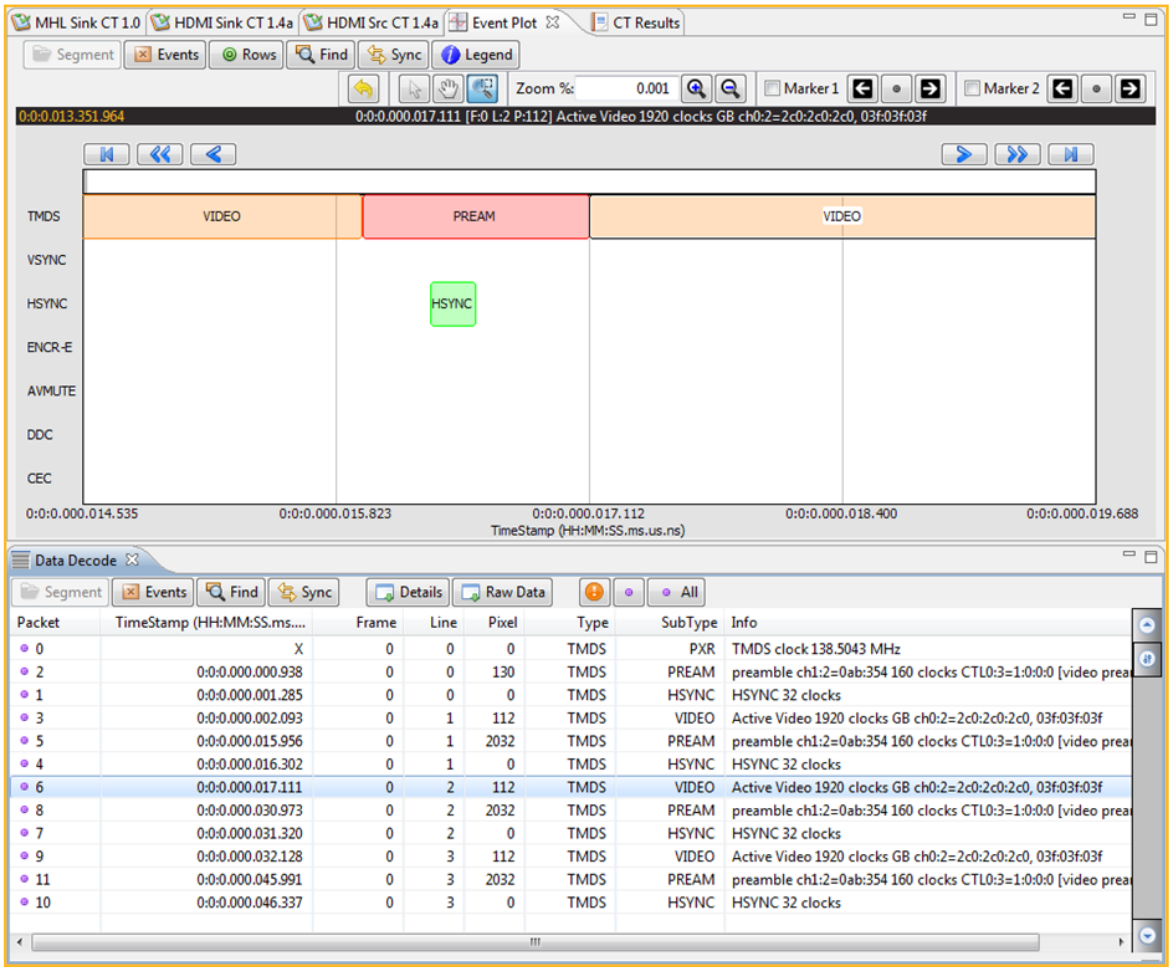

Figure 5

SUMMARY

The 980's new Protocol Analysis mode is the only commercially available HDMI Protocol Analyzer that can provide the visibility into this information even at the higher speeds of HDMI 1.4a for 4K by 2K resolutions.

The Quantum Data 980 Protocol Analyzer…an ideal solution for self-testing or pre-testing HDM source devices for compliance. And an essential tool for diagnosing the root cause of protocol failures in HDMI source devices.